compared by Busk to the appearance produced in unripe cellulose, such as is wont to occur in the lower plants. But in plants we have quantities of cellulose mixed with gelatinous substances, so that in the treatment with iodine and sulphuric acid we have all sorts of immature colours, indicating a mixture of blue and red, brown and yellow. Such a play of colours takes place in the spleen, especially in the amyloid substance from the pulp and follicles, but in no case does the blue or blue-red come forward with such clearness as in the Malpighian bodies and afferent arteries of the parenchyma of the kidney. Our author concludes that sooner or later the albuminous substance of the tissues disappears, and is replaced by amyloid substance. In those instances where the substance differed still more from starch proper it becomes more like cellulose proper; and the organs affected show that peculiar look called waxy or lardaceous. The same idea is acknowledged by Virchow to have arisen also at Edinburgh independently of himself. Generally the indurated organs are enlarged, leaving no doubt of the deposit of new matter. The coexistence of the same alteration in the spleen, liver, and kidneys leads naturally to the recognition of a common cause, a constitutional disturbance.

Since the above was written by Virchow in the *Archiv*, he has made another communication on the same subject; but before speaking of this, we will mention a communication made[1] by Mr. Carter, entitled the "Extensive Diffusion and Frequency of Starch Corpuscles in the Tissues of the Human Body." In this, it will be seen, a different view is maintained on certain points. This observer saw the starch bodies in a tumour involving the optic nerve, and also the pineal gland of man and sheep; and, since then, made extensive experiments, examining in succession thirteen human bodies out of the clinical wards of Professor Bennett, of Edinburgh. He met with two kinds of starch, one resembling wheat, the other potato starch; and he found them in the liver, spleen, kidneys, brain, pancreas, mesenteric glands, suprarenal capsules, Pacchionian bodies, mesentery, lungs, ovaries, scrofulous matter, pus, urine, epidermis, blood, and other places, in organs as well healthy as diseased. In one case he found them around an apoplectic clot, but could not find them in any other part of the brain. In a case of diabetes, the other organs presented an unusual amount, but the liver was *free* from any. He never seems to have found them in the muscular structure of the heart. In the sheep, oxen, and lower animals, they were found in the same indiscriminate way; and the author says that they have hitherto been mistaken for fatty oil globules, to which, from form and refractile powers, they have much resemblance. He considers them as of physiological, not of pathological interest, being ordinary constituents of the body, and, as he calls them, "the thermogenic magazines," analogous to fatty substance, and capable, possibly, of conversion into grape sugar and carbonic acid, or into the lactic acid of the gastric juice.

In the second paper by Virchow (*Archiv*, p. 364), to which we have alluded, the author thinks he has made considerable advances on the subject. In all the cases in which he found the cellulose, chronic and extensive disease of the osseous system existed; and he thinks these diseases exercise a determinate influence on the production of the waxy "degeneration"—the disease, especially caries and necrosis, inducing a deficit of nutrition and cachexy, thus robbing the spleen, kidneys, &c., of their natural elements, and disposing them to take on the degeneration. He has never met with the amyloid substance in the bones, but has so done in the cartilage of the joints of an old person with senile arthritis.—*Brit. and For. Med.-Chirurg. Rev.*, April, 1856.

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2. *The Earthy Phosphates in Urine.*—NEUBAUER, who has conducted a very laborious and precise investigation respecting the quantities of earthy phosphates present in urine under various conditions, has arrived at the following results:—

1. In the normal state, a growing man of 20–25 years old, partaking of a mixed diet, voids in twenty-four hours, as the mean of fifty-two observations, from .9441 to 1.012 grammes of earthy phosphates. The maximum voided in

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[1] Edinburgh Medical Journal. August, 1855.

twenty-four hours amounted, upon an average, from 1.138 to 1.263 grm., and once only to 1.554 grm. The minimum amounted, upon an average, to .8 grm., and once only to .328 grm.

2. The phosphate of lime, as a mean of fifty-two observations, amounted to from .31 to .37 grm. The mean maximum was from .39 to .37 grm.; the mean minimum was nearly constant, .25 grm., and only once amounted to .15 grm.

3. The phosphate of magnesia amounted to .64 grm., as the mean of fifty-two observations. The maximum was, upon an average, .77 grm.; only once were .938 grm. voided. The mean minimum amounted to .5 grm., but once sank to .178 grm.

4. In the normal condition, upon an average, three equivalents of $2\ MgO, PO_5$ were voided to one equivalent of $3\ CaO, PO_5$. As a mean the entire phosphates consisted of 67 per cent. of phosphate of lime, and 33 per cent. of phosphate of magnesia in 100 parts.

5. Salts of lime, when taken, pass over, either not at all or in very small quantity, into the urine. The entire quantity of normal phosphates passing into the urine undergoes, in consequence, no important increase.

6. In disease, the absolute quantity of earthy phosphates, as well as the relative proportion between the lime and magnesia phosphates, appear to depart considerably from the normal condition.—*Lancet*, April 26, 1856.

MATERIA MEDICA AND PHARMACY.

3. *Quinated Cod-Liver Oil.* By M. DONOVAN.—A preparation of cod-liver oil, called *oleum aselli cum quina*, has been lately introduced into medical practice, and is favourably noticed by some practitioners. It is probable that the tonic effects of quinine, conjoined with the restorative powers of the oil, may afford a combination of greater efficacy than is possessed by either separately. To many persons, the mawkish taste of the oil modified into the decided bitter of the quinine is an improvement. I have been informed that the combination of sulphate of quinine with cod-liver oil is effected by exposing them in a state of mixture to a certain temperature: if the heat be too high or too low, the combination, it is said, will either not take place or it will be subverted. I have made some trials with very unsatisfactory results, the quantity of sulphate which dissolved being very small, as might be expected from the character of sulphates in general.

Aware that the alkaline basis of sulphate of quinine possesses some of the properties of a resin, it seemed probable that it might dissolve in oil; and, on making the experiment, I found that this is actually the case.

The alkaloid quinine is known to possess little efficacy as a medicine on account of its insolubility in aqueous liquids; hence, it is always administered in the state of acidulated disulphate, or, in other words, in the state of sulphate. Oil, by rendering quinine soluble, develops the medicinal virtues of that alkaloid, and thus, for every useful purpose, acts the part of sulphuric acid.

A few trials convinced me that quinine may be dissolved in cold cod-liver oil in even greater ratio than is ever necessary for the purposes of the physician. A solution of eight grains to the ounce is intensely and persistently bitter. When the mixture is first made, a very disagreeable and peculiar smell is developed; but by exposure to the air for an hour or two, or better by filtering, the smell exhales and is dissipated. The colour of the oil is deepened by the combination.

This compound, which may be briefly named *oleum aselli quinatum*, has this advantage, that two active medicines, of coinciding effects, may be thus administered at one dose. To some, it is a severe trial to swallow either of them; and to such persons it would be a relief, instead of taking two separate disagreeable doses at different times, to swallow both at once, and have done with them.